



Pollution Prevention Fact Sheet

Title:

Ozone Water Treatment: Eliminating Chemical Additives from Water Systems Which Discharge to the Environment

Current method of eliminating scale and biological growth from cooling water systems relies on the addition of regulated chemicals which are eventually discharged to the environment.



Preferred alternative is the use of a chemical-free ozone treatment system.



Description:

To insure proper operation and reduce maintenance, chemicals which control scale deposition and biological growth are routinely added to cooling water systems. Due to routine water losses, chemicals must be continuously added to maintain concentrations at an effective level. Since evaporation causes the concentration of system-fouling debris, disposal of some portion of the water inventory to permitted recharge basins is needed on a regular basis. From the recharge basins, chemicals may eventually reach potable groundwater sources. An ozone injection system is the preferred alternative to continuous chemical addition because it eliminates the need for chemical biocides and may reduce or eliminate the need for chemical corrosion inhibitors.

Two funding options are proposed here: Option 1 involves providing ozone treatment for the RHIC RF water system, Option 2 would provide ozone treatment for the RHIC STAR detector water system.

Project Title: Ozone Water Treatment: Eliminating Chemical Additives from Water Systems Which Discharge to the Environment

Project Features:

Host Site Brookhaven National Laboratory
Host PSO Program Secretarial Office is Department of Science, SC
Dept/Div Collider-Accelerator Department
Point of Contact Russell Grandinetti, Bldg. 911B, X7186, russg@bnl.gov
Benefits Ozone treatment reduces or eliminates the need to release regulated water chemicals into the environment where they can eventually reach potable groundwater. Substituting ozone also improves environmental regulatory compliance.

| | |
|----------------------------------|---|
| Project Type | Source Reduction, Waste Minimization |
| Primary Wastes Avoided | Biocide (commercial name: Biosperse 261T) and corrosion inhibitor (commercial name: Drewgard 187) |
| Projected Annual Waste Reduction | 1,500 gallons of chemicals discharged to the environment |
| Projected Useful Life | > 10 years |
| Requested Capital Funds | 1. \$40,000 (RHIC RF option) 2. \$87,000 (STAR option) |
| Requested Expense Funds | \$10,000 |
| TOTAL PROJECT COST | 1. \$50,000 (RHIC RF option) 2. \$97,000 (STAR option) |
| Projected Annual Savings | \$15,000 |
| PAYBACK PERIOD | 1. 3.3 yrs (RHIC RF option) 2. 6.4 yrs (STAR option) |
| Non-financial Benefits | Reduced risk to health of maintenance personnel enhances the working environment, while elimination of environmental chemical discharges makes a positive public statement. |
| Regulatory Drivers | USEPA 40 CFR Part 109–140, 230, 231, 401 and NY State Dept. of Environmental Conservation 6NYCRR Parts 700-703, 750-758, Pollution Prevention Act of 1990 |
| Critical Outcomes | B1. Consistently Meet All SPDES Permit Limits. C2. Evaluate and Implement Pollution Prevention Measures. C3. Eliminate Significant Spills |
| Implementation Schedule | If funding were made available in early CY01, purchase of the equipment could be completed before the end of FY01. Installation time is difficult to predict. |

Potential for Broader Application:

Any DOE building which utilizes a cooling tower for circulating water systems could benefit from the application of an ozone treatment system. Cost savings accrue from decreased chemical and water use requirements and from a reduction of wastewater volume. Fewer chlorinated compounds and other chemicals are discharged to the environment. Cooling towers associated with air-conditioning chillers are good candidates for ozone application.